

Candidate Number:

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# G1 - PHYSICS Practical (DCP & CE)

By: .....

Teacher: Mr. R. BOEYINK

Date: .....

School: International School Singapore

## “Focal Length of a Converging Lens”

### CRITERIA ASSESSED

In this practical you will be asked to write a partial lab report. This written report will be assessed against:

☐ Data Collection & Processing      ☐ Conclusion & Evaluation

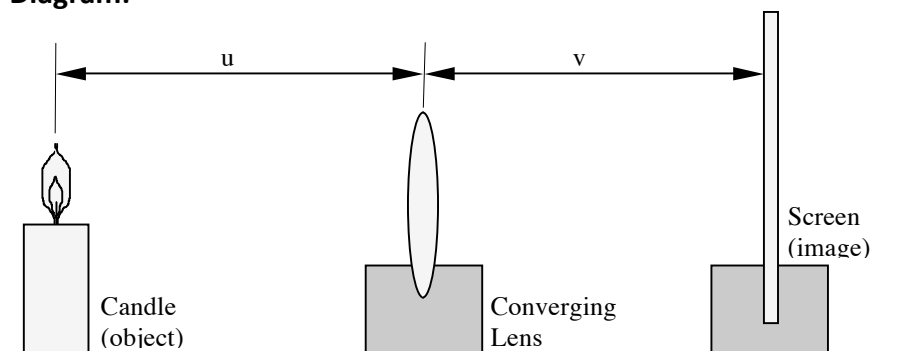
Criteria	Aspects*	C	P	N
Data collection and processing	Recording raw data			
	Processing raw data			
	Presented processed data			

Criteria	Aspects*	C	P	N
Conclusion and Evaluation	Conclusion			
	Evaluation			
	Improving the investigation			

\* C stands for Completely (2 marks), P stands for Partly (1 mark) and N stands for Not at all (0 marks)

### YOUR TASK

To find the focal length of a converging lens by experimental method

**Diagram:****Method:**

1. Set the apparatus up as shown in the diagram, so that the lengths  $u$  and  $v$  are equal and so that the image of the candle appears in focus on the screen.
2. Record lengths  $u$  and  $v$ .
3. Move the candle away from the lens by 20 cm more and adjust the screen distance ( $v$ ), until the image is one again in focus. Record  $u$  and  $v$  in the table.
4. Repeat step 3, three more times (moving the candle further away from the lens). Record  $u$  and  $v$  each time.
5. Place the candle and screen back in the original position found in step 1.
6. Move the screen away from the lens by 20 cm more and adjust the candle distance ( $u$ ), until the image is one again in focus. Record  $u$  and  $v$ .

**Theory:**

The relationship between  $u$ ,  $v$  and the focal length  $f$  for a converging lens is:  $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

**Data Collection & Processing:**

- ☐ Collect and record pairs of data ( $u$  and  $v$ ) including units and uncertainties.
- ☐ Present these data clearly in a suitable table.
- ☐ Process your raw data in a way which will allow you to accurately calculate the value of  $f$  (the focal length of the lens) – graph  $u$  and  $v$  in such a way that the slope of the line gives you  $f$ .
- ☐ Take into account any errors or uncertainties in your processed data.

**Conclusion and Evaluation:**

- ☐ Give a conclusion and explanation of your results; compare to literature values if possible.
- ☐ Your explanation should include diagrams to explain some of the measurements taken.
  - the object close to the lens (between pole and focal point)
  - the object and image at the same position.
  - the object far away from the lens.
- ☐ Evaluate the above procedure (method) and apparatus used, including limitations, weaknesses or errors.
- ☐ Suggest ways of improving the investigation.